

## **ABSTRACT OF THE DISCLOSURE**

The invention described in this disclosure involves a new composition of matter, amyloid beta-derived dementing ligands (ADDL's). ADDLs consist of amyloid  $\beta$  peptide assembled into soluble globular non-fibrillar oligomeric structures that are capable of activating specific cellular processes. The invention further encompasses methods for assaying the formation, presence, receptor protein binding and cellular activities of ADDLs. The invention further encompasses assay methods and inhibitor molecules for cellular signaling molecules activated by ADDLs. Also described are molecules that block proteins that promote the formation of ADDLs.